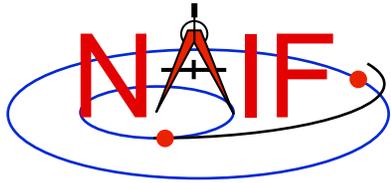


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Navigation and Ancillary Information Facility

# **SPICE Toolkit Common Problems**

**January 2012**



# Topics

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- **Prevention**
- **The “Common Problems Required Reading” document**
- **Reporting a Problem to NAIF**



# Prevention - 1

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- **Get well setup to use SPICE**
  - Use a Toolkit obtained directly from NAIF and intended for your specific environment (platform/OS/compiler/compiler options)
    - » Be extra careful about 32-bit versus 64-bit hardware
  - Use a current Toolkit
    - » Newer Toolkits may have bug fixes and new features you need
      - Toolkits are always backwards compatible, so you should have no problem re-linking your application to the latest Toolkit
  - Read the pertinent documentation
    - » Tutorials, module headers, Required Reading technical reference documents, comments inside kernels
  - Get the correct (usually latest) kernel files
    - » Verify that coverage and intended use are suitable
  - If you are using a Fortran Toolkit, be sure your text kernels all use the line termination appropriate for your platform.
    - » Unix/Linux/OSX use <LF>; PC/Windows uses <CR><LF>
    - » Using the BINGO utility from the NAIF website to make the change, if needed, is one solution.

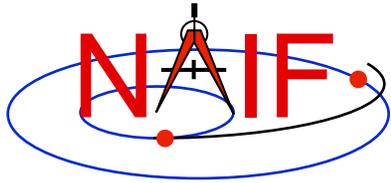
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# Prevention - 2

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- **Avoid common programming problems**
  - **Verify use of the correct time system for your need**
    - » e.g., TDB, UTC, or SCLK?
  - **When using SCLK time tags, be sure to form your SCLK string to match the specification within the SCLK kernel**
    - » **Make sure the fractional part is in the form that is expected**
  - **Verify that correct reference frames are used**
    - » e.g., MOON\_PA versus MOON\_ME?
    - » e.g. which version of the IAU\_Mars body-fixed frame?
  - **Check definitions of geometric quantities**
    - » **Geodetic versus latitudinal coordinates**
    - » **Oblate versus spherical body shapes**
  - **Check aberration corrections**
    - » **Converged Newtonian light time + stellar aberration, light time + stellar aberration, light time only, or none?**
    - » **Target orientation corrected for light time?**
  - **Don't confuse an instrument reference frame ID with the ID of the instrument itself (the object ID)**

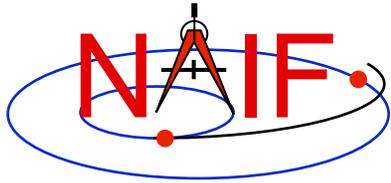


# Useful Documentation

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- **NAIF has compiled a list of common problems, probable causes, and solutions encountered by users of the various SPICE Toolkits:**
  - Refer to `.../doc/html/req/problems.html` or `...doc/req/PROBLEMS.REQ`, both of which are provided in each Toolkit package.
- **Some tutorials (e.g. SPK and CK) contain a section near the end describing common problems.**
- **It may be useful to read these documents BEFORE embarking on extensive SPICE-based programming projects, since some problems are best solved early in the software development cycle.**



# Reporting a Problem to NAIF

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- **If you need help troubleshooting a programming or usage problem, you can send email to NAIF. At a minimum include these items in your email message.**
  - **The SPICE or operating system diagnostic messages written to the screen or to log files.**
  - **The name and version of the operating system you're using.**
  - **The name and version of the compiler or programming environment (IDL, Matlab).**
  - **The Toolkit version you are using, i.e. N0064 (also called N64).**
  - **Names of the kernel files being used.**
    - » **You may need to provide the kernels themselves if these are not available to NAIF.**
  - **Your inputs to SPICE modules that signaled the error.**
  - **If possible, a code fragment from where the error seems to occur.**
- **Send the email to anyone on the NAIF team.**